

# CHEMICALS

## Project Fact Sheet



## TOTAL COST ASSESSMENT SOFTWARE

### BENEFITS

- Identification of best environmental and economic options in business decision-making
- Alignment of environmental goals with good business strategies
- Integration of internal costs and externalities into a single assessment process
- Reduced manufacturing costs
- Minimized risk
- Increased energy savings

### APPLICATIONS

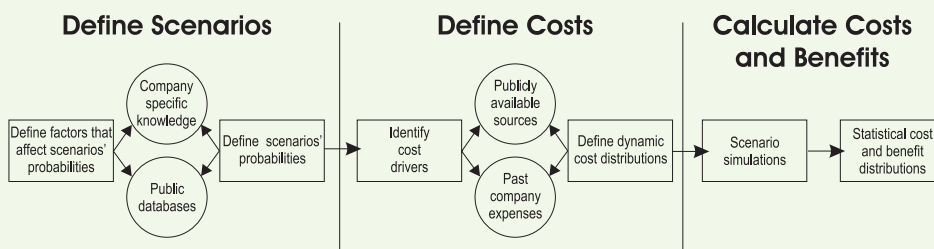
Total cost assessment software can be used throughout the chemicals industry in considering all the environmental and health costs associated with a business decision, such as process, project, or corporate-level investment alternatives.

## NEW SOFTWARE TOOLS USING TOTAL COST ASSESSMENT METHODOLOGY COULD IMPROVE INVESTMENT DECISION-MAKING

In traditional chemical industry decision-making, environmental health and safety (EHS) assessments have been conducted separately from life cycle cost analyses. This customary separation has limited the influence and relevance of life cycle assessment for decision-making, and left uncharacterized the important relationships and tradeoffs between the economic and environmental performance of alternative decisions. Stakeholder and societal pressures to characterize the EHS impacts of various decisions have led to the voluntary reporting program, Responsible Care®, which has helped the industry reduce its environmental footprint over the past decade. Nevertheless, traditional financial analyses have not fully accounted for both tangible and intangible costs and benefits, particularly environmental and health impacts.

Total Cost Assessment (TCA) provides a practical and revolutionary method that integrates both economic and environmental performance, and their tradeoff relationships, into product/process design decision-making. TCA software allows users to incorporate the TCA methodology quickly and easily into their existing economic evaluation framework to better estimate the true costs of a project. Demonstration projects have shown that a single TCA analysis could improve expected decision profitability by millions of dollars and increase energy savings.

### THE TCA PROCESS



The TCA process defines scenarios and their costs in a methodical manner.



## Project Description

**Goal:** To develop a computer software package capable of integrating environmental life cycle assessment and scenario-based risk analysis to provide a complete description of all potential environmental and health related costs associated with a process or product.

The TCA methodology developed during the project differentiates five cost types: direct, indirect, contingent, intangible, and external. The first four types are internal costs borne by the company; these costs are included in a comprehensive life-cycle cost evaluation of investment alternatives, although traditional LCC assessments capture only direct and some indirect costs. TCA software is specially designed to enable users to broaden the cost scope to include less tangible costs applying quantitative methods which are fully consistent with their companies' existing approaches to LCC assessments of direct and indirect costs. This consistency with existent corporate accounting conventions can include approaches to capital depreciation, treatment of taxes, discounting, and the time horizon of LCC evaluations. Also, users can import the results of conventional LCC assessments of direct and indirect costs into TCA software from their existing financial accounting software or databases.

## Progress & Milestones

Work has been completed on

- identifying the costs involved in a life-cycle cost assessment,
- developing the TCA methodology, and
- designing a TCA computer software tool (called TCAce)

Further progress is being made in

- analyzing the results of commercial demonstration projects, and
- marketing TCAce to companies industry-wide.

## Commercialization

The initial design of the TCA software tool has been developed, and the consortium of industrial partners within the American Institute of Chemical Engineers' Center for Waste Reduction Technologies have been the first to implement the tool. Arthur D. Little and Sylvatica are now marketing the package commercially at a competitive price.



### PROJECT PARTNERS

Center for Waste Reduction  
Technologies  
American Institute of Chemical  
Engineers  
New York, NY

Arthur D. Little  
Cambridge, MA

Sylvatica  
North Berwick, ME

### FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

Brian Valentine  
Office of Industrial Technologies  
Phone: (202) 586-1739  
Fax: (202) 586-1658  
brian.valentine@ee.doe.gov

Please send any comments, questions,  
or suggestions to  
webmaster.oit@ee.doe.gov

Visit our home page at  
[www.oit.doe.gov/chemicals](http://www.oit.doe.gov/chemicals)

Office of Industrial Technologies  
Energy Efficiency  
and Renewable Energy  
U.S. Department of Energy  
Washington, D.C. 20585



November 2001